

WHAT IS CLAIMED

1. A driver circuit for at least one light emitting diode device comprising:

first and second input nodes, which are adapted to be coupled to a source of AC or DC voltage and to which a load, powered by said source of AC or DC voltage is coupled;

an input rectifying diode coupled to said first input node;

a controlled current flow element coupled in a first current flow path between said input rectifying diode and said at least one light emitting diode device, and being controllably operative to supply current for illuminating said at least one light emitting diode device; and

a controlled current regulation circuit coupled with said controlled current flow element between said first and second nodes and being operative to regulate the amount of current supplied over said first current flow path by said controlled current flow element to said at least one light emitting diode device, and thereby accommodate variations in the value of said source of AC or DC voltage.

2. The driver circuit according to claim 1, wherein said controlled current flow element comprises a first transistor having an input electrode coupled to said input rectifying diode, an output electrode coupled to said at least one light emitting diode device, and a

control electrode coupled through a limiting resistor to said input rectifying diode.

3. The driver circuit according to claim 2, wherein said controlled current regulation circuit comprises a sense resistor coupled between said at least one light emitting diode device and said second input/output node, and a second transistor having an input electrode coupled to the control electrode of said first transistor, an output electrode coupled to said second input/output node, and a control electrode coupled to said sense resistor.

4. A method of controlling application of electrical energy to at least one light emitting diode device to indicate the presence of electrical energy coupled to an associated load from a voltage source, said method comprising the steps of:

(a) coupling a first path, through which said voltage source is coupled to said load, to an input rectifying diode;

(b) coupling a current supply path for said at least one light emitting diode device to said input rectifying diode, and through a sense resistor to a second path through which said voltage source is coupled to said load;

(c) providing a current regulation path between said input rectifying diode and said second path through which said voltage source is coupled to said load, and

coupling said current regulation path to said current supply path for said at least one light emitting diode device; and

(d) causing said current regulation path to regulate current flowing through said current supply path to said at least one light emitting diode device in accordance with the voltage sensed across said sense resistor.

5. The method according to claim 4, wherein said current supply path comprises a first transistor having an input electrode coupled to said input rectifying diode, an output electrode coupled to said at least one light emitting diode device, and a control electrode coupled through a limiting resistor to said input rectifying diode, and to said current regulation path.

6. The method according to claim 5, wherein said current regulation path comprises second transistor having an input electrode coupled to the control electrode of said first transistor, an output electrode coupled to said second input/output node, and a control electrode coupled to said sense resistor.

7. A driver circuit for at least one light emitting diode (LED) device comprising:

first and second nodes through which a voltage source is coupled to a load;

an input rectifying diode coupled between said

first node and each of a first resistor and the collector of an LED current supply transistor, said LED current supply transistor having its base coupled said first resistor, which is coupled to the collector of a current sense transistor;

said current sense transistor being capable of passing a collector current that is larger than the base bias current for said LED current supply transistor;

said LED current supply transistor having its emitter coupled to said at least one LED, which is coupled to the base of said current sense transistor and to a current sense resistor;

said current sense resistor and the emitter of said current sense transistor being coupled to said second node; and wherein,

application of either an AC voltage source or a DC voltage source of the appropriate voltage polarity to said first and second nodes will cause current to flow through said input diode and said first resistor, so as to forward bias the base-emitter junction of said LED current supply transistor, turning on said LED current supply transistor, causing current from said input diode to flow through the collector-emitter path of said LED current supply transistor and forward bias said LED to turn on; and wherein,

as a result of current flowing through the collector-emitter path of said LED current supply transistor, said LED and said current sense resistor to said second node, a voltage drop across said sense

resistor is applied to the base-emitter junction of said sense transistor, so that as current increases through a path containing said LED current supply transistor, said LED and said sense resistor, it eventually reach a point that the voltage drop across said sense resistor will exceed the turn-on voltage of the base-emitter junction of said sense transistor, causing said sense transistor to draw current away from the base of said LED current supply transistor, thereby reducing the base bias to said LED current supply transistor and consequently decreasing the current flow through the collector-emitter path of said LED current supply transistor; and wherein

the resulting reduction in current flow through the collector-emitter path of said LED current supply transistor reduces current flow through said LED and said sense resistor so as to effectively regulate current through said LED over a relatively wide range of input voltage.